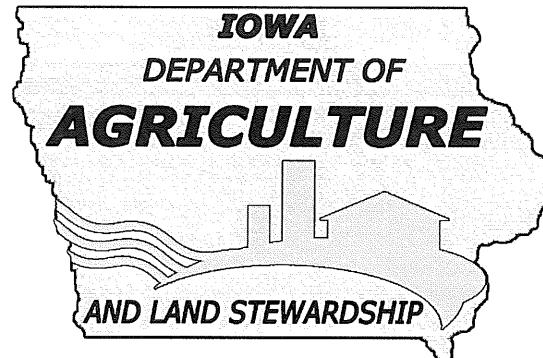


Iowa Department of Agriculture & Land Stewardship  
BILL NORTHEY, Secretary of Agriculture

STATE CLIMATOLOGIST OFFICE

# IOWA CLIMATE REVIEW

VOLUME 31, NUMBER 10  
OCTOBER 2017



The cooperation of the National Weather Service offices at Davenport, Johnston (Des Moines), La Crosse, Sioux Falls and Valley (Omaha) and their network of volunteer weather observers across Iowa in providing the data used in compiling this report is gratefully acknowledged.

## CONTENTS

Monthly Narrative .....	1
Monthly Graphs .....	2
Wind Data .....	3
Summarized Station Data .....	4
Daily Temperatures .....	8
Daily Precipitation .....	15
Daily Snowfall & Snow Depth .....	18
Station Index .....	24
Reference Notes .....	26

The climatic data used in this report are compiled from official records on file at the State Climatologist Office in Des Moines. Some of these data are of a preliminary nature and are subject to change without notice. Differences may exist in data values published here and those subsequently published in the U.S. Department of Commerce report *Climatological Data Iowa* due to use of differing quality control procedures.

## IOWA MONTHLY WEATHER SUMMARY – OCTOBER 2017

General Summary. Temperatures averaged  $53.2^{\circ}$  or  $2.4^{\circ}$  above normal and precipitation 5.35 inches or 2.74 inches above normal. This ranks as the 34<sup>th</sup> warmest and 4<sup>th</sup> wettest October among 145 years of records. A wetter October was last recorded in 2009 and a warmer one just last year.

Temperatures. The unseasonably warm pattern that began during the second week of September continued with only brief breaks through October 26. Temperatures reached into the eighties somewhere in the state on eleven dates during October with the last one coming on the 21<sup>st</sup> when Burlington reached  $82^{\circ}$ . There were a few very brief cold weather episodes earlier in the month with the first freeze of the season reported at Rock Rapids and Sibley on the morning of the 10<sup>th</sup> and a hard freeze the next morning over portions of far western and northwest Iowa where Sheldon recorded a low of  $25^{\circ}$ . Much colder air finally arrived late in the month. A hard freeze was widespread over most of the northwest one-half of the state on the morning of the 28<sup>th</sup>. The first statewide freeze hit on the morning of the 29<sup>th</sup> with all but the extreme east seeing another hard freeze on the morning of the 31<sup>st</sup>. Monthly extremes varied from highs of  $88^{\circ}$  at Burlington, Indianola, Iowa City, Oskaloosa and Ottumwa on the 2<sup>nd</sup> with lows down to  $14^{\circ}$  at Little Sioux on the morning of the 28<sup>th</sup> and also at Le Mars, Sheldon and Spencer on the morning of the 31<sup>st</sup>.

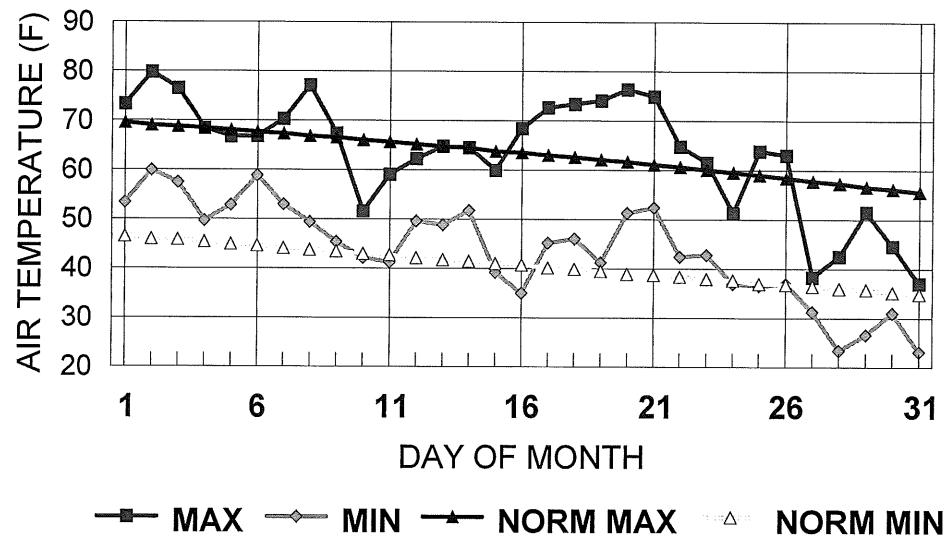
Heating Degree Day Totals. Home heating requirements, as estimated by heating degree day totals, averaged 18% less than normal but 19% more than last October. Thus far this heating season heating requirements are running an estimated 25% less than normal and 22% more than last year at this time.

Precipitation. The big weather news of the month was the frequent and heavy rainfall during the first one-half of October. There were four widespread significant rain events during the first fourteen days of the month. The largest of these events began on the 5<sup>th</sup> and continued into the afternoon of the 7<sup>th</sup> bringing a statewide average of 2.27 inches of rain (nearly matching the October normal of 2.63 inches). Heaviest rains with this event fell across western and northwestern Iowa with 6.69 inches

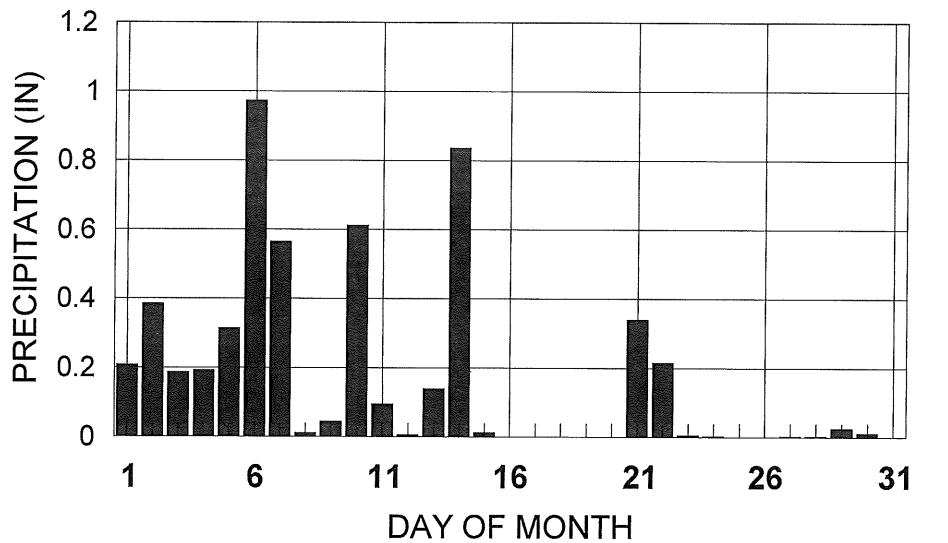
reported near New Market in Taylor County. Other widespread rain events came on the 1<sup>st</sup>-3<sup>rd</sup>, mainly over west and northwest Iowa; then on the 10<sup>th</sup> over eastern Iowa and on the 13<sup>th</sup>-14<sup>th</sup> with greatest amounts over the southeast one-half of the state. A welcome period of dry weather prevailed from the 15<sup>th</sup> through the 20<sup>th</sup> but was followed by another period of widespread rain on the 21<sup>st</sup>-22<sup>nd</sup> when heaviest rains fell from south central into northeast Iowa. A statewide average of only 0.06 inches of precipitation fell over the last nine days of the month. The first snow of the season came from late on the 26<sup>th</sup> through the morning of the 28<sup>th</sup> but with only a few small areas of northern Iowa seeing a brief very light accumulation. There were more snow flurries scattered across Iowa on the 30<sup>th</sup>. Monthly precipitation totals ranged from 2.58 inches at Maquoketa to 9.39 inches near New Market. Every reporting point in the state exceeded their normal October precipitation total except for De Witt and Maquoketa. Three locations set new records for most October rainfall. At Grundy Center 7.37 inches of rain was recorded, breaking their old record of 6.84 inches set in 1919 among 126 years of record. Meanwhile Sioux City recorded 6.83 inches, breaking their old record of 5.80 inches set in 1881 among 135 years of records and Glenwood picked up 7.13 inches surpassing their 1881 record of 6.85 also set in 1881. Relatively dry conditions prior to the early October rains prevented any significant flooding. Drought, with coverage peaking at 45% of the state in mid-August had shrunk to only 6% of Iowa by the end of October. Nevertheless, the latest USDA Ag Statistics weekly weather summary indicated that more than 60% of south central and southeast Iowa remained short or very short of subsoil moisture.

Harry J. Hillaker  
State Climatologist  
Iowa Dept. of Agriculture & Land Stewardship  
Wallace State Office Bldg.  
Des Moines, IA 50319  
Telephone: (515) 281-8981  
E-mail: Harry.Hillaker@IowaAgriculture.gov

## IOWA DAILY MAX & MIN TEMPERATURES OCTOBER 2017 (SELECTED STATIONS)



## IOWA AVERAGE DAILY PRECIPITATION OCTOBER 2017 (SELECTED STATIONS)

































OCTOBER 2017				DAILY NEW SNOWFALL FOR THE 24 HOURS ENDING AT THE OBSERVATION TIME (OBS TIME) AND TOTAL DEPTH OF SNOW ON GROUND (INCHES)																												IOWA CLIMATE REVIEW										
STATION	OBS	TIME	TOTAL	DAY OF MONTH																												31										
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30									
<b>NORTHWEST DIVISION</b>																																										
Cherokee	8	SNOWFALL	T																														T	T	T	T						
		SNOW ON GROUND																																T								
Emmetsburg	8	SNOWFALL	T																															T	I							
		SNOW ON GROUND																																T								
Estherville 4 E	7	SNOWFALL	T																															I	I		T					
		SNOW ON GROUND																																I								
Everly 3 WNW	7	SNOWFALL	T																															T	T		T					
		SNOW ON GROUND																																								
Le Mars	7	SNOWFALL	T																															I	I							
		SNOW ON GROUND																																								
Orange City	7	SNOWFALL	T																															T	T		T					
		SNOW ON GROUND																																T								
Pocahontas	8	SNOWFALL	0.1																														0.1	I								
		SNOW ON GROUND																																I								
Primghar	16	SNOWFALL	T																																I	I						
		SNOW ON GROUND																																								
Remsen #2	7	SNOWFALL	T																																I	I						
		SNOW ON GROUND																																								
Rock Rapids	8	SNOWFALL	T																																	I						
		SNOW ON GROUND																																								
Rock Valley	7	SNOWFALL	T																																	T	T					
		SNOW ON GROUND																																								
Sanborn	8	SNOWFALL	T																																	I	I					
		SNOW ON GROUND																																								
Sheldon	7	SNOWFALL	0.2																																0.2	T						
		SNOW ON GROUND																																	T							
Sibley	7	SNOWFALL	T																																	I	I					
		SNOW ON GROUND																																								
Sioux Center 2 SE	16	SNOWFALL	T																																		T					
		SNOW ON GROUND																																								
Sioux Rapids 4 E	22	SNOWFALL	T																																			T	T	T		
		SNOW ON GROUND																																								
Spencer 1 N	24	SNOWFALL	T																																			T	T			
		SNOW ON GROUND																																								
Spirit Lake 4 W	24	SNOWFALL	T																																			T	T			
		SNOW ON GROUND																																								
Storm Lake	8	SNOWFALL	T																																				T	I		
		SNOW ON GROUND																																								



OCTOBER 2017				DAILY NEW SNOWFALL FOR THE 24 HOURS ENDING AT THE OBSERVATION TIME (OBS TIME) AND TOTAL DEPTH OF SNOW ON GROUND (INCHES)																						IOWA CLIMATE REVIEW												
STATION	TIME	OBS	TIME	TOTAL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	DAY OF MONTH		
Cresco 1 NE	7	SNOWFALL	T																														T	T				
		SNOW ON GROUND																																				
Decorah	16	SNOWFALL	T																													I	I					
		SNOW ON GROUND																																				
Dubuque Lock & Dam 11	6	SNOWFALL	T																															I				
		SNOW ON GROUND																																				
Dubuque Airport	24	SNOWFALL	T																															T				
		SNOW ON GROUND																																				
Elkader 6 SSW	7	SNOWFALL	T																																	T	T	
		SNOW ON GROUND																																				
Fayette	7	SNOWFALL	T																																	T	T	
		SNOW ON GROUND																																				
Guttenberg L & D 10	6	SNOWFALL	T																																	I		
		SNOW ON GROUND																																				
Ionia 2 W	7	SNOWFALL	T																																	I		
		SNOW ON GROUND																																				
Manchester #2	7	SNOWFALL	T																																	T	T	
		SNOW ON GROUND																																				
New Hampton	8	SNOWFALL	T																																	T	I	
		SNOW ON GROUND																																				
Oelwein 1 E	7	SNOWFALL	T																																	T	T	T
		SNOW ON GROUND																																				
Postville	7	SNOWFALL	T																																	I		
		SNOW ON GROUND																																				
Stanley 3 WSW	7	SNOWFALL	T																																	T	T	
		SNOW ON GROUND																																				
Strawberry Point	7	SNOWFALL	T																																	T	T	
		SNOW ON GROUND																																				
Tripoli	7	SNOWFALL	T																																	T		
		SNOW ON GROUND																																				
Waterloo Airport	24	SNOWFALL	T																																	T	T	
		SNOW ON GROUND																																				
<b>WEST CENTRAL DIVISION</b>																																						
Audubon	8	SNOWFALL	T																																	T	T	
		SNOW ON GROUND																																				
Battle Creek 3 NE	8	SNOWFALL	T																																	I		
		SNOW ON GROUND																																				
Carroll	7	SNOWFALL	T																																			I
		SNOW ON GROUND																																				



OCTOBER 2017				DAILY NEW SNOWFALL FOR THE 24 HOURS ENDING AT THE OBSERVATION TIME (OBS TIME) AND TOTAL DEPTH OF SNOW ON GROUND (INCHES)																												IOWA CLIMATE REVIEW			
STATION	OBS TIME	TOTAL		DAY OF MONTH																															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
Perry	7	SNOWFALL	T																													T			
		SNOW ON GROUND																																	
Toledo 3 N	7	SNOWFALL	T																													T	T		
		SNOW ON GROUND																																	
Webster City	7	SNOWFALL	T																													I			
		SNOW ON GROUND																																	
Zearing	7	SNOWFALL	T																													I			
		SNOW ON GROUND																																	
EAST CENTRAL DIVISION																																			
Anamosa 3 SSW	6	SNOWFALL	T																													T	T		
		SNOW ON GROUND																																	
Cedar Rapids #1	17	SNOWFALL	T																												T	T			
		SNOW ON GROUND																																	
Coggon	6	SNOWFALL	T																													T			
		SNOW ON GROUND																																	
Davenport Airport	24	SNOWFALL	T																												T	T	T	T	
		SNOW ON GROUND																																	
Lowden	24	SNOWFALL	T																												T	T	T	T	
		SNOW ON GROUND																																	
Monticello	7	SNOWFALL	T																												I				
		SNOW ON GROUND																																	
Muscatine 2 N	7	SNOWFALL	T																														T		
		SNOW ON GROUND																																	
Swisher	7	SNOWFALL	T																												I	I			
		SNOW ON GROUND																																	
Vinton	7	SNOWFALL	T																												I				
		SNOW ON GROUND																																	
SOUTHWEST DIVISION																																			
Atlantic 1 NE	7	SNOWFALL	T																													T			
		SNOW ON GROUND																																	
Oakland	7	SNOWFALL	T																												T		T		
		SNOW ON GROUND																																	
SOUTH CENTRAL DIVISION																																			
Allerton	8	SNOWFALL	T																														T		
		SNOW ON GROUND																																	
SOUTHEAST DIVISION																																			
Fairfield	8	SNOWFALL	T																														T		
		SNOW ON GROUND																																	
SUPPLEMENTAL STATIONS																																			
Sioux Falls WFO AP	24	SNOWFALL	T																												T	T		T	
		SNOW ON GROUND																																T	



OCTOBER 2017			STATION INDEX			IOWA CLIMATE REVIEW			OCTOBER 2017			STATION INDEX			IOWA CLIMATE REVIEW		
STATION NAME	DIV	COUNTY	COORDINATES			(FT)	STATION NAME	DIV	COUNTY	COORDINATES			(FT)				
			DEG	MIN	SEC					DEG	MIN	SEC					
Akron	NW	Plymouth	42	49	37	96 33 21	1125										
Albia 3 NNE	SC	Monroe	41	3	56	92 47 12	890										
Algona 3 W	NC	Kossuth	43	4	6	94 18 19	1230										
Allerton	SC	Wayne	40	42	15	93 22 11	1110										
Allison	NC	Butler	42	45	13	92 48 8	1048										
Ames Airport	C	Story	41	59	26	93 37 8	955										
Ames 8 WSW	C	Boone	42	1	15	93 46 27	1099										
Ames 5 SE	C	Story	41	57	7	93 33 56	870										
Anamosa 3 SSW	EC	Jones	42	5	35	91 18 7	906										
Ankeny	C	Polk	41	43	6	93 34 27	940										
Atlantic 1 NE	SW	Cass	41	25	3	95 0 14	1148										
Audubon	WC	Audubon	41	42	25	94 55 20	1280										
Battle Creek 3 NE	WC	Ida	42	22	12	95 34 30	1380										
Beaconsfield	SC	Ringgold	40	48	25	94 2 51	1215										
Bedford	SW	Taylor	40	40	27	94 43 28	1190										
Belle Plaine	EC	Benton	41	52	53	92 16 35	810										
Bellevue L & D 12	EC	Jackson	42	15	40	90 25 23	603										
Bloomfield 1 WNW	SE	Davis	40	45	35	92 26 22	812										
Boone	C	Boone	42	2	30	93 53 26	1035										
Brighton	SE	Washington	41	10	33	91 49 6	609										
Britt	NC	Hancock	43	6	6	93 48 5	1240										
Brooklyn	C	Poweshiek	41	44	22	92 26 24	910										
Burlington Airport	SE	Des Moines	40	46	51	91 7 9	692										
Carroll	WC	Carroll	42	3	54	94 51 0	1227										
Cascade	NE	Dubuque	42	17	56	90 59 54	870										
Castana Exp. Farm	WC	Monona	42	3	48	95 50 11	1450										
Cedar Rapids Airport	EC	Linn	41	53	0	91 43 0	868										
Cedar Rapids #1	EC	Linn	42	3	0	91 35 17	810										
Centerville	SC	Appanoose	40	44	11	92 52 9	980										
Chariton 1 E	SC	Lucas	41	0	59	93 16 45	940										
Charles City	NC	Floyd	43	3	37	92 40 18	993										
Cherokee	NW	Cherokee	42	45	26	95 32 16	1180										
Clarinda	SW	Page	40	43	28	95 1 19	980										
Clarion	NC	Wright	42	43	12	93 44 1	1156										
Clinton #1	EC	Clinton	41	47	41	90 15 50	594										
Clutier	C	Tama	42	4	48	92 24 18	900										
Coggon	EC	Linn	42	16	45	91 31 30	903										
Corning 1 W	SW	Adams	40	59	18	94 45 32	1190										
Cresco 1 NE	NE	Howard	43	23	22	92 5 38	1255										
Creston 2 SW	SC	Union	41	2	14	94 23 39	1320										
Dakota City	NC	Humboldt	42	43	32	94 11 43	1110										
Davenport Airport	EC	Scott	41	36	42	90 34 54	748										

OCTOBER 2017			STATION INDEX			IOWA CLIMATE REVIEW			OCTOBER 2017			STATION INDEX			IOWA CLIMATE REVIEW				
STATION NAME	DIV	COUNTY	COORDINATES			(FT)	STATION NAME	DIV	COUNTY	COORDINATES			(FT)						
			DEG	MIN	SEC					DEG	MIN	SEC							
Knoxville	SC	Marion	41	19	29	93	6	3	915	Postville	NE	Allamakee	43	5	24	91	33	29	1165
Lake Mills	NC	Winnebago	43	25	4	93	32	5	1260	Primghar	NW	O'Brien	43	5	11	95	37	45	1520
Lamoni	SC	Decatur	40	37	24	93	57	3	1128	Randolph	SW	Fremont	40	52	28	95	34	0	980
Lamoni Airport	SC	Decatur	40	37	50	93	54	3	1135	Rathbun Dam	SC	Appanoose	40	49	30	92	53	33	965
Le Claire L & D 14	EC	Scott	41	34	29	90	24	2	577	Red Oak	SW	Montgomery	41	0	13	95	14	31	1040
Le Mars	NW	Plymouth	42	46	54	96	8	45	1320	Remsen #2	NW	Plymouth	42	48	37	95	58	30	1330
Little Sioux 2 NW	WC	Harrison	41	49	35	96	3	2	1025	Rock Rapids	NW	Lyon	43	25	48	96	10	7	1347
Logan	WC	Harrison	41	38	17	95	47	18	1030	Rock Valley	NW	Sioux	43	12	16	96	18	22	1246
Lorimor	SC	Union	41	7	29	94	3	5	1230	Rockwell City	WC	Calhoun	42	23	49	94	37	45	1224
Lowden	EC	Cedar	41	51	23	90	55	48	715	Sac City	WC	Sac	42	25	10	94	58	34	1210
Manchester #2	NE	Delaware	42	28	24	91	27	6	990	Saint Ansgar	NC	Mitchell	43	22	54	92	55	24	1139
Mapleton #2	WC	Monona	42	9	43	95	47	1	1200	Salem 1 S	SE	Henry	40	50	8	91	37	20	650
Maquoketa 4 W	EC	Jackson	42	2	58	90	44	56	782	Sanborn	NW	O'Brien	43	10	45	95	39	37	1551
Marshalltown	C	Marshall	42	3	53	92	55	28	871	Sheldon	NW	O'Brien	43	10	51	95	51	10	1420
Marshalltown Airport	C	Marshall	42	6	38	92	54	58	974	Shenandoah	SW	Page	40	46	2	95	22	48	975
Mason City	NC	Cerro Gordo	43	9	47	93	11	43	1105	Sibley	NW	Osceola	43	24	17	95	44	54	1529
Mason City Airport	NC	Cerro Gordo	43	9	16	93	19	37	1225	Sidney 1 SSE	SW	Fremont	40	44	10	95	38	35	1140
Massena	SW	Cass	41	15	19	94	45	54	1325	Sigourney	SE	Keokuk	41	20	11	92	12	16	800
Moline Airport		Rock Island, IL	41	27	55	90	31	24	592	Sioux Center 2 SE	NW	Sioux	43	3	21	96	9	9	1360
Montezuma 1 W	C	Poweshiek	41	35	1	92	32	59	965	Sioux City Airport	WC	Woodbury	42	23	29	96	22	45	1095
Monticello	EC	Jones	42	14	28	91	10	24	820	Sioux Falls		Minnehaha, SD	43	34	40	96	45	14	1428
Mount Ayr	SC	Ringgold	40	42	19	94	14	34	1180	Sioux Rapids 4 E	NW	Buena Vista	42	53	35	95	3	55	1420
Mount Pleasant 1 SSW	SE	Henry	40	56	55	91	33	53	730	Spener Airport	NW	Clay	43	9	52	95	12	6	1338
Muscatine	EC	Muscatine	41	24	27	91	4	22	549	Spencer 1 N	NW	Clay	43	9	55	95	8	48	1326
Muscatine 2 N	EC	Muscatine	41	28	17	91	3	47	680	Spirit Lake 4 W	NW	Dickinson	43	25	53	95	10	56	1430
Nashua 2 SW	NC	Floyd	42	56	13	92	34	13	1059	Stanley 3 WSW	NE	Buchanan	42	38	0	91	51	48	1114
New Hampton	NE	Chickasaw	43	2	43	92	18	44	1148	Storm Lake	NW	Buena Vista	42	38	49	95	11	36	1442
Newton	C	Jasper	41	42	42	93	1	47	960	Strawberry Point	NE	Clayton	42	41	7	91	31	57	1200
Northwood	NC	Worth	43	26	19	93	13	31	1190	Swea City 4 W	NC	Kossuth	43	24	8	94	22	59	1239
Oakland	SW	Pottawattamie	41	18	16	95	23	4	1260	Swisher	EC	Johnson	41	50	59	91	40	35	790
Oelwein 1 E	NE	Fayette	42	40	48	91	52	30	1165	Toledo 3 N	C	Tama	42	2	8	92	34	50	949
Omaha Eppley Airport		Douglas, NE	41	18	37	95	53	57	982	Tripoli	NE	Bremer	42	48	45	92	15	27	960
Orange City	NW	Sioux	43	0	2	96	3	14	1380	Underwood	SW	Pottawattamie	41	23	22	95	40	52	1080
Osage	NC	Mitchell	43	16	46	92	48	38	1170	Vinton	EC	Benton	42	10	13	92	0	28	850
Osceola	SC	Clarke	41	1	10	93	45	1	1028	Washington	SE	Washington	41	16	57	91	42	28	687
Oskaloosa	SE	Mahaska	41	19	17	92	38	48	830	Washta	NW	Cherokee	42	34	25	95	43	5	1160
Ottumwa Airport	SE	Wapello	41	6	28	92	26	48	842	Waterloo Airport	NE	Black Hawk	42	33	16	92	24	4	868
Ottumwa 5 W	SE	Wapello	41	0	36	92	31	3	833	Webster City	C	Hamilton	42	28	7	93	47	50	1170
Pella 1 S	SC	Marion	41	22	34	92	55	13	780	Williamsburg 1 E	EC	Iowa	41	39	54	91	59	52	810
Perry	C	Dallas	41	50	22	94	6	38	965	Winterset 1 S	SC	Madison	41	18	22	94	1	6	1104
Pocahontas	NW	Pocahontas	42	43	45	94	39	41	1212	Zearing	C	Story	42	10	1	93	18	35	1116

# REFERENCE NOTES

## DEFINITIONS

STATION NAMES: Name of the city or locality. Figures and letters following the station name indicate the distance and direction from the post office or town community center.

NORMALS: The average of the meteorological element over the period from 1981 to 2010. Normals are calculated by the National Climatic Data Center and are revised once every 10 years. The precipitation and snowfall normals are strictly an average of the values recorded during the 1981-2010 period. However, temperature and degree day normals may have been adjusted to better correspond to the current (as of 2010) temperature measurement practice and thus may vary slightly from the average of the original 30-year values.

DEGREE DAYS: One heating (cooling) degree day is accumulated for each whole degree that the daily mean temperature [average of the daily maximum and minimum air temperature] is BELOW (ABOVE) 65°F. Degree days are used to provide a measure of the effect of temperature upon energy consumption for heating or cooling of homes or buildings. The greater the heating (cooling) degree day total, the greater the amount of energy needed to heat (cool) your home or building.

PRECIPITATION: Values shown in hundredths of an inch are water equivalent totals, i.e., total of liquid (rain) and melted frozen (snow, sleet, hail) precipitation. The snowfall data tables include the unmelted depth of snow and sleet in tenths of an inch. The depth of snow on the ground (SN ON GROUND) refers to the depth of all snow or ice (new or old). This 'Snow on Ground' value is the depth of snow on the ground at the time of the precipitation observation at all stations *except*: Burlington, Davenport, Des Moines, Dubuque, Mason City, Moline, Omaha, Ottumwa, Sioux City and Sioux Falls Airports where the snow depth is measured at 6 a.m. CST while the new snowfall is that for the 24 hour period ending at midnight. Daily precipitation and snowfall amounts are for the 24 hours ending at the time of observation (given in the 'OBS TIME' column). An asterisk in the daily precipitation table indicates that the rain gage was not read that day. A multi-day precipitation total is included in the amount immediately following the asterisks.

TEMPERATURE: The daily maximum (MAX) and minimum (MIN) temperatures are recorded for the 24 hours ending at the time of observation. The significance of the time of observation in interpreting these data is discussed in the preceding paragraph.

TIME OF OBSERVATION: At most locations measurements of temperature and precipitation are made only once daily at the same hour of the day. This time is referred to as the 'Time of Observation' and is given in the 'OBS TIME' column of the data tables. All observations, unless otherwise noted, are for the 24 hour period ending at the time of observation. Note that in most cases the resulting data are not for calendar day (i.e., midnight-to-midnight) periods and further that the temperature observations may be made at a different time than the precipitation observation at the same station. See the PRECIPITATION paragraph in this section for a further explanation of the significance of the time of observation. All times are expressed on a 24-hour clock (i.e., 7 a.m. = 7; 5 p.m. = 17; midnight = 24, etc.).

## SYMBOLS USED IN THE DAILY AND MONTHLY DATA TABLES.

'      ' Underlined data in the daily temperature, precipitation and snowfall tables indicates that the data in question has been estimated. Estimated data are provided when the original measurements are not available or are of suspect accuracy.

*ITALICS*. Data given in italics in the daily precipitation or snowfall tables indicate that the date on which the precipitation was reported has been changed from what was given on the original reports.

'+' A plus sign in the monthly summarized data tables indicates that the temperature or precipitation extreme given also occurred on one of more earlier dates during the month.

BLANK ENTRIES: Blank entries in the monthly summarized data table indicates that no data are available. Blank entries in the daily precipitation and snowfall data tables indicates that no precipitation was recorded. M = missing, no data recorded.

## ABBREVIATIONS:

TMP DEP NOR: Temperature departure from the 1981-2010 normal.

EXT MAX: Extreme maximum temperature for the month and the day on which it was measured.

EXT MIN: Extreme minimum temperature for the month and the day on which it was measured.

MAX 90+: Number of days with maximum temperatures which were greater than or equal to 90°F.

MAX 32-: Number of days with maximum temperatures which were less than or equal to 32°F.

MIN 32-: Number of days with minimum temperatures which were less than or equal to 32°F.

MIN 0°: Number of days with minimum temperatures which were less than or equal to 0°F.

17/18 SEAS: 2017-2018 season (July 1, 2017 through the end of the published month).

NOR SEAS: Normal number of degree days through the end of the published month.

DEP NORM: Monthly precipitation total departure from 1981-2010 normal.

EXT DAY: Extreme one-day precipitation amount and the day on which it occurred.

.01+: Number of days with precipitation of 0.01 inch or greater.

.10+: Number of days with precipitation of 0.10 inch or greater.

1.00+: Number of days with precipitation of 1.00 inch or greater.

MAX ON GRD: Maximum depth of accumulated snow on the ground (inches) and the day on which it was measured.

OBS TIME: Observation Time: The time (24-hour clock) at which the daily temperature and/or precipitation measurement is made (7 = 7 a.m.; 17 = 5 p.m.; 24 = midnight).

DIV: Climate Division: NW = northwest, NC = north central, etc.

LAT: Latitude in degrees and minutes north.

LON: Longitude in degrees and minutes west.

T: Trace: < 0.005" of precipitation; < 0.05" snowfall or < 0.5" snow on ground.

